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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,639	12/28/2001	Do-Young Lee	29926/38066	6899

4743 7590 06/02/2005

MARSHALL, GERSTEIN & BORUN LLP
233 S. WACKER DRIVE, SUITE 6300
SEARS TOWER
CHICAGO, IL 60606

EXAMINER

LAM, HUNG H

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/032,639	Applicant(s) LEE, DO-YOUNG	
	Examiner Hung H. Lam	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>06/14/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because “memory byffer” in Fig. 2 should be changed to “memory buffer”. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Art Unit: 2615

3. Figure 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (US-6,545,624).

With regarding to **claim 1**, Lee discloses a CMOS image sensor, comprising:

an image capturing means for converting light incident upon a photo-sensitive area to an analog image signal (Fig. 3; Pixel Array 307);

an analog-to-digital converter for converting the analog image signal to a digital image signal (Fig. 3; ADC 30; Col. 3, Ln. 54-59); and

a ramp signal generator for producing a ramp signal in order to provide a reference voltage signal to the analog-to-digital converter (Fig. 3; comparator 310 compares pixel signal 306 with reference ramp signal 305), the ramp signal generator including: a plurality of capacitors and switches (Fig. 4A; Col. 4, Ln. 30-43);

an amplifier coupled to the plurality of capacitors and switches for receiving gain and reset voltages from external circuitry (see Fig. 4A; amplifier 401, Capacitors C11-IM, Switches S1-SM, SW1-SW4, T1-TM, V_GAIN and V_RESET); and

capacitance controlling means coupled in parallel to at least one of the plurality of capacitors in the ramp signal generator in order to form the ramp signal for an analog gamma correction (Col. 1, Ln. 49-60; Col. 4, Ln. 58-67; it is inherent that the programmable multi-slope ADC taught in Lee lowers pixel noise).

With regarding to **claim 2**, Lee discloses the CMOS image sensor wherein the plurality of switches (S1-SM,T1-TM,SW1-SW4) in the ramp signal generator are selectively operated in response to control signals from a digital controller in the CMOS image sensor (Fig. 4A; Control signal CLK1 and CLK2; Col. 3, Ln. 60-64; Col 4, Ln. 51-55).

With regarding to **claim 3**, Lee discloses the CMOS image sensor wherein the capacitance controlling means includes the plurality of capacitors and the plurality of switches to selectively connect the plurality of capacitors to the amplifier in response to the control signals from the digital controller (Fig. 4A; Col. 3, Ln. 60-64; Col 4, Ln. 51-55; the plurality of capacitors C11-C1M inherently connect to the amplifier 401 in response to clock CLK1 and CLK2).

With regarding to **claim 4**, Lee discloses the CMOS image sensor further comprising: counting means for creating a digital counting value based on a result signal from a chopper comparator (Fig. 3, Counter 302; Col. 4, Ln. 1-3; Col. 4, Ln.16-29; counter 302 coupling to and storing counted value in to the storage 312 based on the output signal of comparator 308); and a latch circuit for storing the digital counting value from the counting means (Col. 4, Ln. 22-24).

With regarding to **claim 5**, Lee discloses a CMOS image sensor, comprising:

an image capturing means for capturing an analog image signal from an object (Fig. 3; Pixel Array 307);

an analog-to-digital converter to convert the analog image signal to a digital image signal (Fig. 3; ADC 30; Col. 3, Ln. 54-59); and

a ramp signal generator producing a ramp signal in order to provide a reference voltage signal to the analog-to-digital converter (Fig. 3; comparator 310 compares pixel signal 306 with reference ramp signal 305), said ramp signal generator including: a first switch connected to a gain voltage (Fig. 4A; switch S1 is coupled to V_GAIN);

a plurality of second switches connected in parallel to the first switch (Fig. 4A; see switches S2-SM);

a plurality of capacitors connected to the second switches (capacitors CI2-CIM are connected to Switches S2-SM respectively);

a third switch connected between the first switch and a ground voltage level (Switch T1 is connected between first switch S1 and Vss which is commonly used in the art as ground);

a fourth switch commonly connected to the plurality of capacitors and connected to a reset voltage (SW1 is connected between plurality of capacitors CI2-CIM and V_RESET);

a fifth switch connected to the plurality of capacitors (SW2 is coupled to capacitors CI2-CIM);

an amplifying means for receiving the reset voltage and receiving the gain voltage via the fifth switch for outputting the ramp signal (see the connections between V_RESET, V_GAIN, SW2, and amplifier 401);

a sixth switch connected in parallel to the amplifying means (SW4); and

a capacitor connected in parallel to the sixth switch (C2).

With regarding to **claim 6**, Lee discloses the CMOS sensor wherein the plurality of capacitors and the second switches in the ramp signal generator are selectively connected to each other in response to control signals from a digital controller in the CMOS image sensor (Fig. 4A; Col. 3, Ln. 60-64; Col 4, Ln. 51-55; the plurality of capacitors CI2-CIM inherently connect to the second switches S2-SM in response to clock CLK1 and CLK2).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Fowler et al. (US-5,801,657) disclose a serial A/D converter having logarithmic compression or gamma correction achieved by comparison values for the signal Ramp.

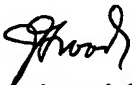
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung H. Lam whose telephone number is 571-272-7367. The examiner can normally be reached on Monday - Friday 8AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary, NGOC YEN VU can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

5/16/05

HL


James J. Groody
Supervisory Patent Examiner
Art Unit 262 2615